

UTILIZATION OF NASA-GENERATED SPACE TECHNOLOGY BY
MIDWESTERN INDUSTRY

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QUARTERLY PROGRESS REPORT NO. 1
5 November 1961 - 5 February 1962

Task Order Contract No. NASr-63(03)

M.R.I. Project No. 2563-M

OTS PRICE

XEROX \$ 1.10 ph
MICROFILM \$ 1.80 mf

For

Office of Research Grants and Contracts
Code SC
National Aeronautics and Space Administration
Washington 25, D. C.

M I D W E S T R E S E A R C H I N S T I T U T E

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by

H. M. Gadberry

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PREFACE

This Quarterly Progress Report covers project activity from 5 November 1961 through 10 February 1962. The report was prepared by the project leader, H. M. Gadberry.

Approved for:

MIDWEST RESEARCH INSTITUTE

A handwritten signature in dark ink, appearing to read "M. H. Thornton", written in a cursive style.

M. H. Thornton

Vice President and Technical Director

23 February 1962

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I. INTRODUCTION

Work under Contract No. NASr-63(03) was initiated on 5 November 1961. An oral progress report covering the first three months was presented to Dr. T. L. K. Smull in Washington on 9 February 1962, just prior to the meeting of the NASA Future Applications Program.

This progress report summarizes the principal accomplishments during the quarter, outlines our plans for the immediate future, and calls attention to certain problems which may require solution by NASA headquarters.

II. PROJECT STATUS

The project aims remain unchanged and can be simply stated as:

...Find useful space-derived ideas.

...Match these concepts with industrial needs.

...Induce midwestern industry to apply this advanced technology.

...Report to NASA about results.

To accomplish these over-all goals we have developed the plan outlined in general form on the flow sheet appended to this report. Because this plan includes several activities which depart somewhat from the original program concept, the reasons for these modifications should be considered.

The main change has been a shift away from principal reliance upon NASA's formal technical reports as the primary source of industrially useful ideas. To provide more varied and more numerous commercially applicable concepts, sources of ideas in addition to NASA's technical notes and technical reports had to be developed. To supplement NASA's formal reports we propose also to include the NASA patent portfolio and invention disclosure file; direct contact with research people in NASA centers; commercial announcements and trade journals; and results of selected Department of Defense space programs.

The decision to utilize these additional sources carries with it certain corollaries:

1. We do not intend to differentiate too closely between NASA efforts and other developments resulting from the advanced requirements for space and missile programs.

2. We will be more concerned that firms in the Middle West are made aware of and persuaded to use the latest applicable technology than with identifying the exact source of the development.

In addition to demonstrating ideas having exclusive space origin, we will portray others having different origins but receiving additional development and refinement from the space effort.

Special emphasis has been placed thus far on direct contact with the NASA research centers. These establishments are perhaps the best source of all for NASA innovations, and particularly for the useful by-products which may not receive adequate treatment in a NASA report.

Many contractor developments are publicly announced and given fairly wide coverage a considerable time before a report is available as a NASA publication. This situation is expected to change as reporting practices are improved, and as the NASA Documentation Center progresses. But at present we believe it is important to find and utilize, as soon as practical, the many developments made by contractors.

There are numerous unresolved and unforeseen problems with respect to patents, associated with negotiating the use of these ideas by general industry. Effective use of the invention disclosure file and patent portfolio is advantageous to our program for two reasons:

1. Patents and disclosures represent a source of readily describable, useful concepts.

2. Availability of patent licenses to industry is expected to have a significant psychological effect on industry.

We are presently working with Mr. G. D. O'Brien and Mr. S. T. McCoy in the office of the counsel for Patent Affairs to develop effective ways of presenting these ideas to industry, and proper methods for the handling of industry negotiations to use NASA inventions.

III. MAJOR PROJECT ACTIVITIES AND ACCOMPLISHMENTS

1. Midwest Research Institute teams have visited six NASA centers: Langley, Manned Spacecraft and Marshall in December; JPL, Flight Research, and Ames in January. A total of 45 man-days of effort has been devoted to these briefings and the accompanying technical assessment discussions.

2. As a result of extensive technical discussions during these visits, MRI has obtained a detailed over-all picture of the fields of specialization of each center, and the types of industrial developments to expect from each establishment.

3. Through our contacts with the NASA centers, MRI has identified 120 different, discrete, ideas resulting from NASA innovation or research and development. At present about 90 of these are believed to have some industrially interesting applications, but may require that MRI describe the ideas for industry separately from their space-related uses, and suggest appropriate nonspace uses.

These ideas represent a wide variety of concepts ranging from specific useful developments to more general principles. A typical list includes:

Concrete Ideas

New materials
Novel uses of materials
Fabricating techniques
Mechanical devices
Instruments and transducers
Electromechanical devices
Electronic devices and
 circuitry
Lubrication, friction and wear
Surface treatments
Corrosion control
Auxiliary power sources

Broad Concepts

Information handling
Data display
Adaptive controls
Human engineering
Systems analysis
Quality assurance
Value engineering
Program management
Reliability
Long life equipment

4. Thirty of these ideas are now being processed by us to collect descriptions, photographs, performance data and, where possible, physical examples to display in our forthcoming industrial meetings.

5. In January, MRI held a planning meeting in Omaha with 43 representatives of 26 firms and organizations (public utilities, railroads, etc.) who were already active in area development in the Iowa-Nebraska region. This meeting served to inform this core group of industrial development people about the NASA-MRI project and to solicit their support and advice. The response of those attending was most enthusiastic. These firms are assisting MRI in the selection of participating companies for the initial industrial meeting to be held in Omaha on March 8. Approximately 150 Nebraska industrialists will attend.

We will show how space exploration can have (and already has had) an important influence on industrial technology. The presentation will use slides, exhibits, and demonstrations to emphasize the benefits of adapting space discoveries to nonspace uses.

6. Criteria have been established to permit the selection of the participants for future industrial meetings. Appropriate lists have been prepared of 300 firms in Iowa and Nebraska having technical bases or interests. Similar listings are being prepared for the other states. A questionnaire is being prepared to register the technical activities, capabilities, and interest of the firms participating in this program so that we can serve these firms on a "field of interest" basis.

7. A group of NASA inventions which should be industrially useful have been selected. These inventions will be discussed, along with other ideas, at future regional meetings. Since we expect some problems to arise in getting NASA inventions into commercial use, the response of industry to these selected ideas will be most useful in planning our future role in disseminating information about space-related inventions. One or two ideas from each of the following categories will be employed:

- a. Issued patents assigned to NASA;
- b. Issued patents held by the inventor;
- c. Disclosures in processing, and pending applications; and
- d. Abandoned or inactivated ideas.

The degree of industrial interest in these inventions can also help NASA to resolve the policy and procedural problems associated with the wider use of inventions.

8. Following the Omaha meeting March 8, we will schedule other regional meetings with industry at regular intervals in Des Moines, Davenport, Wichita, Topeka, Little Rock, Tulsa, Oklahoma City, Springfield, Kansas City, and St. Louis.

9. We have answered between 30 and 40 inquiries from industry regarding the program. Practically all of these inquiries could be traced to announcements appearing in aerospace or electronics journals. The great majority of the inquiries was from outside the six-state region. Present interest in the six states further demonstrates the need for an active dissemination program.

IV. PROBLEMS AFFECTING FUTURE PLANS

Analysis of the firms within the six-state region shows considerable activity in agricultural product processing, food preservation, pharmaceuticals and packing. While NASA's own life science program is expected to become very extensive in a few years, thus far it has been necessary for NASA to utilize the findings of the Air Force Aeromedical R & D program. At present NASA's life science output does not match in emphasis the regional interest in nutrition, biochemistry, foods and medicinals. Therefore, to bridge this interim gap, MRI would like to arrange suitable liaison with the U. S. Air Force activities at San Antonio, Dayton, Holloman and other centers and requests NASA's approval to do so.

In addition to the dissemination of ideas representing concrete developments which can be conveniently described in written form, it is apparent that certain "broad concepts" can be expected to have an important impact on industry over the next few years. Typical examples of such concepts are the reliability philosophy, management of complex programs, design and fabrication of long-life devices, and the use of nonlinear adaptive controls. As part of our dissemination program, we plan in the future to arrange specific technical conferences in the six states on these subjects which would involve universities, industry, and NASA scientists.

In a somewhat similar way, basic and advanced research ideas reported by NASA will be submitted to the universities in this region to stimulate their awareness of and participation in space research programs to supplement our current six-state university program.

Certain possible problem areas have been identified which require help from NASA headquarters. Four of these needs are being taken care of by the newly initiated Future Applications Program and by the Documentation Center. These needs are:

1. An agency-wide information program to inform NASA workers about the applications program.

2. Suitable organization at each NASA installation to receive and channel useful ideas to the applications office and to MRI.

3. Continuing NASA center help in providing documentation and additional details about industrially useful by-products.

4. Documentation Center assistance in providing information on related non-NASA ideas.

Four other areas of NASA policy determination will have significant effect on the MRI industrial program:

1. An effective way needs to be devised to follow NASA development programs while they are in progress.

2. Procedures to obtain and utilize NASA contractor R & D reports should be devised.

3. The policies affecting the status and availability of NASA inventions to industry should be clarified as quickly as possible. Appropriate ways of offering these ideas to industry must be developed, and the procedures for negotiating licenses must be worked out. The goal here should be to get the technology into use by industry without adding to the existing controversy surrounding government patents.

4. A simple, rapid procedure for approving and clearing ideas prior to release to industry should be instituted. The present plan to obtain approval of the NASA source, the director of Grants and Contracts, the Patent Counsel and the Applications Office appears to involve a considerable chance of delaying each release.

The early resolution of these problems will facilitate the dissemination of industrially useful ideas from the space program by MRI.

